

THURSDAY, MAY 24, 1883

SCIENCE AND ART¹

WE stated in our article last week that we should take an early opportunity of noticing some of the pictures in this year's Academy, with especial reference to the points which we then mentioned. The following notes are a fulfilment of that promise. It is to be understood that only those pictures which illustrate, either by their perfection or their defects, the points in question have been referred to. The pictures have been classified according to the particular class of natural phenomena which they portray.

SKY COLOUR

2. "Homewards," Wm. J. Monkhouse Rowe. Sky not zoned; impossible colour of clouds. Perhaps our word zoned requires some little explanation. When the sun is at such an altitude above the horizon that the blue rays are absorbed, and there begins to be colour on cloud and sky, then the sky at the same altitude is always of the same colour, and the colours gradually modulate from the warmest at bottom to the coolest at top. These remarks with regard to the sky have, of course, nothing whatever to do with the clouds, but whatever the colour of the clouds may be, and this will depend upon various conditions, any true clouds, however they may be coloured, shown on the picture at the same altitude, will be surrounded by the same sky colour, even if the intensity differs in consequence of different distances from the sun's place. For instance, if a painter chooses to put a bright green sky at 5° or 10° elevation on the right of his picture, and then paints a blue sky at the same elevation above the horizon on the left, he is showing something which is impossible: his picture is not perfectly zoned.

76. "Welbourne Hall, Yorkshire," H. A. Olivier. Sky well zoned, but its reflection from water too intense. Reflection will naturally lower the tone of the reflected light, but, all the same, this difference may not come out very strongly, for the reason that the reflection is most frequently and necessarily shown in a darker part of the picture, so that although by mere contrast the tone seems lowered, it will yet appear to be brighter than the tone seen in the region of more general illumination.

132. "To Pastures New," James Guthrie. Sky of impossible colour.

121. "Freshening," A. Harvey Moore. Sky and sea both admirable.

157. "Corrie, Isle of Arran," John MacWhirter, A. Sky admirable; water a little doubtful. It is also not level.

218. "The Dogana and the Island of San Giorgio, Venice," Frank Dillon. Sky colour and water reflection good.

233. "After Sundown," Frances R. Binns. Excellent in sky colour, but zoning might have been more perfect.

242. "Superstition," Everton Sainsbury. Good and bold sky colour, especially the red, but the sky is too much worked to resemble cloud.

246. "Autumn," A. Glendening, jun. Good, and forms of clouds quite excellent.

¹ Continued from p. 51.

247. "The Forgotten Sheaf," F. S. Walker. Zoning gone wrong; green never rests on white, nor on gray.

269. "And the Unclean Spirits went out of the Swine," Briton Riviere, R.A. Bold and perfect sky and clouds.

297. "Windsor," Vicat Cole, R.A. Might have been more evenly zoned.

315. "A Mortally Wounded Bandit Chief Exhorting his Comrades to Return to an Honest Living," J. R. Herbert, R.A. There is no relation between the light, the colour of the sky, and that of the landscape.

327. "Grouse-driving on Bowes Moor, Yorkshire," George Earl. It is difficult to understand by what means the sky to the left is illuminated.

331. "Carting for Farmer Pengelly," J. C. Hook, R.A. Sky and clouds admirable; green on the cliff very striking.

371. "A Silent Pool," Fred. E. Bodkin. A slight change in the colour of the clouds would make this an admirable picture.

394. "November," E. A. Walton. Let us hope this is not true sky colour. Far too deep a green, and there is no reason why the clouds at the top of the picture should not be as intense in their lower portions as the mass of cumulus on the horizon.

398. "Ben Ray," H. W. B. Davis, R.A. There is not sufficient relation between the colour of the sky and the colour of the landscape. (Compare 702.)

700. "Trabacolo Unloading at the Custom House, Venice," Clara Montalba. The sky colour is wrong. There could have been no green where the artist has placed it.

702. "At Kinlochewe," H. W. B. Davis, R.A. (compare 398). In this case the sky is wedded to the landscape, and we have a perfect and harmonious whole beautifully luminous.

713. "A Summer Evening, Folkestone," W. Ayerst Ingram. Nearly perfect zoning of cloudless sky, but the reflection from the water has been a little too much toned down perhaps.

773. "Winnowing Gleanings," H. Gillard Glindoni. Sky and seascape both admirable.

826. "The Boundary of the Heath," J. C. Harrison. Careful study of sky. Bank of trees against it very effective.

793. "Rochester from the River," Charlie W. Wyllie. A pleasing picture—both sky and water good.

1438. "Leaving Labour," E. B. Stanley Montefiore. Impossible green sky.

1503. "Lost Sheep," Robert Page. It is a pity this artist takes the trouble to paint a sky, because it is evident he does not know the difference between sky and clouds.

1483. "A Spanish Aqueduct," Adrian Stokes. Note colour of sky and landscape and effect of heat under tropical sun.

CLOUDS

225. "On Solway Sands," Thomas Hope M'Lachlan. Blue clouds.

257. "Still Waters run Deep," George Chester. The clouds in this picture are hideous in form and impossible in colour.

339. "Night into Day," Vincent P. Yglesais. This may be a view in Mars. It is fortunately impossible here.

577. "Rye, Sussex," Leslie Thompson. A new kind

of cloud is here represented, one resembling mashed potatoes.

602. "A Calm—Bay of Naples," F. W. Jackson. Good study.

1461. "Between the Showers," Henry Moore. Good study of clouds.

DISTANCE AND ATMOSPHERE

279. "Gathering the Flock," H. W. B. Davis, R.A. Perfect distance, toning carefully preserved, and the picture is free from the exaggeration which one so often laments. The illumination of the sheep is, however, too local.

321. "Highlands and Lowlands," William Linnell. Admirably managed distance.

479. "Light in the West: After Rain," Alfred W. Williams. The artist seems to have too strongly contrasted the peaks against the sky. The peaks though high are really distant, and hence there is atmosphere between us and them.

96. "Snowdon," Joseph Knight. Everything that could be desired.

255. "Llyn-yr-Adar on the Adder's Pool, Carnarvonshire," J. W. Oakes, A. This is the picture referred to at length in the preceding article. We repeat that it is a pity the author did not study the rainbow before he attempted to paint it.

843. "Spring Time at Tillietudlam Castle, Lanarkshire," David Murray. The effect of sunshine on grass is here carefully rendered, but there is a little too much colour in the delicate clouds in the centre of the picture.

SUNSETS

98. "Parting Day," B. W. Leader, A. Careful study, rifts admirably attempted, but the treatment of them is not quite perfect, especially on the right of the picture. As a rule the clouds must be lower down than they are here represented to give the effect sought to be rendered.

Note on Rifts.—These rifts, which have attracted the attention of Mr. Leader, are only possible when the air is very densely charged with aqueous vapour, for the reason that they are a projection upon the distant sky of a cylinder, less illuminated than the surrounding air, owing to the interposition of a cloud low down in the atmosphere. Now, as whatever the condition of the air may be it must obviously get more dense as the earth is approached; the lower the cloud the stronger will be the rift, and the more the cylinder of shadow is directed to the point overhead the more definite will be the rift, for the reason that along the line of sight the greatest distance will then be in shadow. We are really in such a case dealing with a partial eclipse of a long column of air, and as at any one place the conditions of the atmosphere at the same time will be almost, if not quite, identical, if rifts produced by clouds are shown on one side of the picture, the other side of the picture should show rifts produced in like manner. This we think is a point which Mr. Leader has very pardonably missed. The reflection of the clouds in the water is not quite true.

164. "Sunset Fires," John MacWhirter, A. This picture is spoiled because the artist has made no distinction between the colours of the sky and of the clouds.

399. "At Last!" Fred. C. Cotman. Sunset and water reflection; a beautiful picture.

1471. "An Autumn Evening," B. W. Leader, A. This is a very fair sunset sky, but a little too cool in colour, and the reflection in the water is not good. There is however a careful bit of painting in the way in which the top of the cumulus is reflected over the bridge.

MOONS, &c.

214. "Tipt with Eve's Latest Glean of Burning Red," James S. Hill. It is quite impossible that such a moon should be at such a height at sunset, besides which the moon is more shapeless than she should look under the given cloud conditions.

232. "Too Late," Frank Dicksee, A. Everything about this picture when we leave the figures, with which we are not at present concerned, is wrong. We have an impossible moon in an impossible sky. The artist has attempted to paint the old moon in the new moon's arms, one of the most beautiful natural phenomena visible after sunset, but by a strange fatality almost every point where science could have assisted the artist has been neglected. As is known to many children, the appearance of the complete body of the moon on such an occasion as this, when only a very thin crescent is illuminated by the sun, depends upon the fact that the earth reflects light to the moon, hence the term "earth shine," the equivalent of "la lumière cendrée" of the French. Under these conditions we have in fact a thin crescent illuminated by direct sunlight, whilst the rest of the moon is illuminated by light reflected from the earth. One of the points of this earth illumination which Mr. Dicksee has entirely missed is this, that the earth-light must be equally distributed over the whole surface of the moon which it illuminates. Sunlight reflected from the earth to the moon, and then reflected back again from the moon to the earth, must be quite general in its action, and must equally light up each part of the lunar surface. Hence the absolutely equable illumination which is always seen, but which this picture fails to show. The fact that the old moon thus illuminated appears to rest in the new moon's arms depends upon irradiation, by the operation of which a thing very brilliantly illuminated looks larger than when it is dimly illuminated. That part of the moon, therefore, which shines by the brilliant light of the sun, appears to belong to a larger body than that part which receives its less brilliant illumination from the earth. This appearance is so obvious that it has given rise to the old world illustrations, in which the "old" moon is represented as in a boat, because in fact the two horns of the crescent moon extend beyond the old moon as we have said, and appear to form part of a larger circle. This point also Mr. Dicksee has entirely missed. What we have to say touching the colour of the sky is, that neither Mr. Dicksee, nor any one else, ever saw such a colour as he has painted to indicate the place of sunset. At such a height above the horizon a green colour is impossible, it must either be red, or yellow, or grey, according to the state of the atmosphere at the time. We have ventured to speak thus at length with reference to this picture, because we consider it a very typical case, and surely Mr. Dicksee, when he becomes acquainted with the facts to which we have drawn attention, and as to which there can, we believe, be no dispute, will regret that he should have disfigured his

picture by disregarding them. Had these things been correctly painted the picture would have been just as beautiful to the ignorant as it is at present, whilst it would have had the additional advantage of being also pleasing to look upon by those who can in its present form only regard it with regret. It may be said that these are simple matters. Be it so. Simple or not they are typical, and that is the point we wish to urge.

260. "The Ides of March," E. J. Poynter, R.A. The comet is admirably rendered, but does not the little lamp give out rather too much light?

697. "The Dawn of Night," Richard Whatly West. It is not easy to understand this picture, as the title of it is "The Dawn of Night"; but if we have the moon rising then the sky is far too dark.

807. "Can He Forget?" Edward H. Fahey. This artist is to be congratulated on his moon. He has painted it so that any one with a very simple calculation can determine that he is quite wrong. If the young lady asking the interesting question had had a crown in her hand, the coin would have covered the real moon. She herself would hardly cover the false one. So, to one who knows, it looks like Nadar's balloon without the netting being inflated. Further, each part of the moon when she rises is generally under the same atmospheric conditions, so that such a variation in its illumination as is here shown is almost impossible unless a definite cloud is darkening its surface, and no such cloud is here to be seen.

888. "Moonlight," Robert Jobling. It would have been better if in this moonlight scene the artist had discriminated more between the clouds and their background the sky.

546. "Moonlight Bay, Milford Haven," F. W. Meyer. Very careful study of moonlight.

WATER

28. "Catching a Mermaid," J. C. Hook, R.A. Colour and forms of waves, and swirl and dash on rocks, good.

133. "Wind against Tide: Rillage Point, Ilfracombe," J. Geo. Naish. Sea and sky excellent in the distance; water a little weak in foreground, both as to colour and forms of waves.

202. "Oyster Dredgers," C. Napier Henry. Water in this picture is not level.

281. "High Tide at Kynance, Cornwall," Sidney R. Percy. The wave at the left is being forced back by nothing, and is altogether too solid.

282. "A Rising Gale: Dunbar Sands, Padstow, Cornwall," Walter J. Shaw. Very bold low front view of breaking waves. Reflection good.

301. "The Gull Rock: off Kynance Cove, Cornwall," Edmund Gill. Colour and form of water quite admirable.

467. "A Travelling Cobbler," Joseph Henderson. Colour of water very true to nature. The distant land deserved more careful painting.

498. "The Last of the Crew," Briton Riviere, R.A. This ice is a careful study of form and colour.

495. "A Fisherman's Garden," Theodore Hines. Water not level.

711. "The Sad Sea Wave," John Francis Faed. Colour of water very brilliant.

695. "Lobster Fishers," Colin Hunter. Form of waves very careful study.

778. "A Haven," C. E. Holloway. Note colour of

water and form of waves. The artist should say where this Haven is, that it may be avoided by all who love the beautiful.

809. "Welsh Dragons," John Brett, A. Note colour of water and rocks. Mr. Brett is again quite perfect in his treatment, but we rather doubt the colour of some of the cumuli that float over the sea, and also their sharp darkened boundaries.

145. "Adrift," R. C. Leslie. An admirable study of water, far too good to be skied.

REFLECTION

36. "Love Lightens Toil," J. C. Hook, R.A. The reflection from the water has not been carefully studied. Does not the green of the grass come too low down to the water? The water, too, is not level. Current indicated.

86. "A Quiet Noon," Peter Graham, R.A. The reflection of the clouds from water is not quite in accordance with their form; the clouds themselves are admirable.

83. "The Enchanted Lake," Albert Goodwin. Careful study of reflection. The artist has left out what most artists would incontinently have put in, but there are several blunders; for instance, it is the under side of the umbrella which should have been reflected, and not the upper one, and the colours of the objects reflected are too entirely lost, as if the reflection were from the bottom of the enchanted lake instead of from its surface. The artist's idea has evidently been that there have been two transmissions of the light through the water, in consequence of which its original colour has been lost. This cannot have been so.

123. "On the Marshes," Percy Belgrave. The ordinary laws of reflection do not seem to apply in this case.

162. "Loch Scavaig, Isle of Skye," Sidney R. Percy. Even if the moon had not been veiled by a cloud we could not get this effect, nor with such rough water would the wake alone have been so illuminated; we should have had side reflections as well.

168. "Loch Alsh," Colin B. Philip. Good; distance and water reflection carefully managed.

356. "Among the Trawlers, Tarbert, Loch Fyne," Andrew Black. Reflection from water very admirably managed.

508. "Green Pastures and Still Waters," B. W. Leader, A. The reflected images of the trees in the distance are about one and a half times as long as the trees themselves. Still water does not magnify the height of objects when they are reflected in it. One of the branches of the tree to the left has also considerably suffered by the reflecting process.

648. "A North Country Stream," Alfred W. Hunt. Very perfect study of water, the light reflected by the surface being mingled with that coming from the bottom.

688. "Willows Whiten, Aspens Quiver," Keeley Halswelle. Admirable landscape and water, but the colour and shapes of the clouds are unsatisfactory, and the picture would be better without them.

1509. "A Pebbled Shore," Colin Hunter. Note the way in which the cumuli are reflected from the waves beneath them. Glorious picture.

1493. "Toil, Glitter, Grime, and Wealth on a Flowing Tide," W. L. Wyllie. An admirable picture, but we question whether the artist is justified in getting such a brilliant reflection from the surface of the water to the

left, where the sky as indicated does not appear to be a very luminous one.

142. "... these Yellow Sands," John Brett, A. In this admirable picture, in which the sea and sky are quite perfect, Mr. Brett has attempted some difficult effects. More transparent water has never been seen on a canvas, and the colour of the yellow sand at its bottom is beautifully mingled with the light reflected from its surface.

626. "Sounding for Shallows at Low Nile," Tristram Ellis. A bold attempt at reflection in the Nile water, but, as a matter of fact, the real colour is not so entirely subordinated by reflection.

SNOWSTORMS

764. "The Joyless Winter Day," Joseph Farquharson. The storm must have been very considerate to the artist. In spite of the driving blast there is not a single snowflake to be seen in the first twenty yards.

THE LIVING ORGANISMS OF THE ATMOSPHERE

Les Organismes vivants de l'Atmosphère. Par M. P. Miquel, Docteur ès Sciences et Docteur en Médecine, Chef du Service micrographique à l'Observatoire de Montsouris. (Paris: Gauthier-Villars; 1883.)

PLUS occidit aer quam gladius, such is the main idea contained and explained in M. Miquel's very able and interesting book. If the modern theories are true, it must be certainly conceded that although the sword and gun are very murderous tools, air is yet more so. But on the other hand one may say of our atmosphere's murderous propensities what a French writer said when he was told that coffee was a poison: "Well, it may be a poison to be sure, but it must be a very slow one; I have been indulging in it for over fifty years." In fact, if Voltaire and many other men took too much of it, it began to tell on them only very late. Taking it for granted that coffee is murderous, it must be also granted that it is not always so. Such is also the case of the atmosphere we live in.

The influence of infinitely small organisms contained in the air and water, as well as in the body of man and animals, can no longer be denied, at least, in a general manner. Certainly much remains to be done to bring the Microbe Theory to the point it must attain; many inconsistencies and discrepancies yet interfere with its general harmony; but Davaine's and Pasteur's experiments and discoveries have certainly opened new ways in science.

Now that it is granted that the organisms alluded to are to be found and may thrive in the air, it is interesting to know what these are, how abundantly they may be found in the atmosphere, and by what means they may be captured and experimented upon. To these important questions M. Miquel answers in a very precise and interesting manner.

It is not a difficult thing to detect the corpuscles contained in the atmosphere; a mere sunbeam in a room shows hundreds of them dancing in the light. But it is less easy to ascertain the nature of these little atoms; great skill is required to do that. Some are vegetable, some are mineral, some are animal.

M. G. Tissandier has established that a great quantity

of mineral atoms is contained in the atmosphere; the most interesting of these are meteoric iron melted into the form of little globules. Some infusoria are also to be found, but bits of wool and silk, pollen and spores are more abundant. As one may easily believe, all these corpuscles are less abundant in the atmosphere after a fall of rain. For instance, M. Tissandier finds in a cubic metre of air 0.023 gramme of dust after a rainless week; 0.006 gramme the day after a heavy rain.

The description given by M. Miquel of the numerous instruments contrived by himself and by others to collect the corpuscles contained in the air is good and interesting, but is not easily condensed. Another very important chapter of this book is that concerning the nature and origin of the aerial corpuscles among which pollen, flour, and spores are most abundant. For instance, the number of spores to be found in a cubic metre of air is about 14,200. But this number changes very much according to the season. In winter the mean number is 6200; in spring, it is 13,000; in summer, 28,000; in autumn, 9800. The reason of these variations is easy to understand.

However abundant spores and pollen, woollen and silk threads may be in the air, that is a question of little importance when compared with that of the presence of bacteria in the atmosphere. Bacteria are to be found, often in great quantity, in the air. Generally speaking, according to M. Miquel's experiments and observations, bacteria are more abundant when the weather is dry; the reverse is to be observed concerning spores of inferior cryptogams. The direction of the prevailing wind has much to do with the number of bacteria found in the air. M. Miquel shows, by means of a diagram, how the air having passed through part of Paris, before coming to the Montsouris Observatory, contains more bacteria than that which passed only over the suburbs and country around the town. South winds bring from 42 to 77 bacteria to a cubic metre of air; northern ones bring from 108 to 152. Other experiments give the same results. M. Miquel draws from his numerous experiments the conclusion that the air in Paris contains nine or ten times more bacteria than does that outside of the fortifications or close to them. For instance, in the Rue de Rivoli, M. Miquel finds an average number of 760 bacteria in autumn, 410 in winter, 940 in spring, and 920 in summer; that is, a mean annual number of 750 bacteria per cubic metre of air. At Montsouris the mean annual number is 75. The minimum number found by M. Miquel is 45 (winter 1882); the maximum is 3000 (summer 1881) bacteria per cubic metre.

In hospitals, the air contains a much greater quantity of bacteria, as might be expected; the cubic metre contains an average of five or six thousand! In some cases M. Miquel has found ten, even sixteen, twenty-one, and *twenty-eight thousand* bacteria per cubic metre of air. These last numbers are stupendous.

These bacteria in the air, liable every moment to penetrate into our lungs and body, are of many sorts. Some are spherical,—the *sphero-bacteria*; they generally have no power of locomotion; some are coloured red or yellow. M. Miquel remarks that although some of these bacteria must exert a pathogenetic action, he has not been able to produce any disease in ani-